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ASCOM NETWORK TESTING
EVOLVING NETWORKS. TRUSTED SOLUTIONS.

SUPPORTING YOUR GOALS
SUPPORTING YOUR
CUSTOMERS

4G
AHEAD

LTE

WiMAX

TODAY'S SOLUTIONS
TOMORROW'S
INNOVATION &

ASCOM NETWORK TESTING – A NEW WORLD LEADER

Ascom Network Testing provides world-class solutions for testing, monitoring, and optimizing wireless communication networks.

People around the world are relying more and more on mobile voice and data services in their everyday lives. To fulfill this ever-increasing need, telecommunications providers must deliver high-quality services efficiently. Ascom's Network Testing solutions are imperative for operators if they want to maintain quality, retain subscribers, and streamline internal processes.

We test from a user's perspective to guarantee quality while simultaneously improving network performance.

Through internal development and recent acquisitions of Argogroup, Comarco Wireless Test Solutions, and TEMS™ Products, Ascom Network Testing has established itself as the world leader for network testing and measurement, reporting and analysis, benchmarking and monitoring, and services testing.

We have over 500 employees in 20 countries dedicated to serving our customers.

- Global presence
- Industry leadership
- Multi-vendor focus
- Customer-centric testing
- All major technologies

THE COMPANY

Ascom is an international provider of Mission-Critical Communication solutions. The company focuses on the areas of Wireless Solutions (high-value, customer-specific on-site communication solutions), Network Testing (a global leader in testing and optimization solutions for mobile networks) as well as Security Communication (secure, reliable communication solutions for alerts, mobilization and tactical communication). Communication is vital to our customers' operations. We strive to develop products and solutions for them which optimally meet their high demands and operate quickly, reliably and seamlessly even under extreme conditions.

Ascom Holding AG is headquartered in Switzerland, has subsidiaries in 20 countries and employs about 2300 people around the world. Ascom registered shares (ASCN) are listed on the SIX Swiss Exchange in Zurich (Switzerland).

Ascom was founded in 1987. However, the origins of our company date back over 100 years. These days, Ascom is a technology group with a clear focus and a partner that our customers can rely on.

OVERVIEW

Wireless communication has changed the world. Mobile phones and networks have evolved, speeds have increased, services have improved, and demand has exploded. However, the need for broad coverage, high quality, and efficient operation has remained through every stage of wireless evolution. The offerings in Ascom's Network Testing portfolio have given operators the ability to meet their needs every step of the way.

As networks and technologies evolve, our trusted solutions will help you troubleshoot, benchmark, and monitor your network to ensure your customers are satisfied. Ascom Network Testing has the experience and expertise you can rely on, both for today's networks and whatever is coming next.

We employ complex technology to create solutions that reduce complexity for our customers; we help them to identify problems quickly, monitor efficiently, and create reports almost effortlessly. We stand at the cutting edge of technology in order to both provide the most advanced solutions and to anticipate our customers' needs.

Comprised of industry-leading products such as the Symphony portfolio and the TEMS product line, the Network Testing portfolio is the unrivaled industry leader in our market niche. The portfolio includes offerings in the areas of Testing & Measurement, Benchmarking & Monitoring, and Reporting & Analysis.

Our offerings are in the following areas:

Test & Measurement – "for troubleshooting and optimization"

Individual probes to test and evaluate the performance and quality of wireless networks and services.
- TEMS Investigation
- TEMS Pocket

Benchmarking & Monitoring – "for quality of service and experience"

Dedicated probe systems to benchmark and monitor the performance and quality of wireless networks, services, and content.
- TEMS Symphony Suite
- TEMS Monitor Master
- TEMS Automatic

Reporting & Analysis – "for post-processing and optimization"

Software to visualize, analyze, and report mobile network performance and quality.
- TEMS Box Office
- TEMS Discovery
- TEMS Visualization

The Network Testing portfolio provides a full range of industry-leading solutions that help operators and other customers to optimally run their networks. The use of our products leads to higher network quality, customer loyalty, and improved operational efficiency. Experience, knowledge, and a focus on future technologies and services have made the Network Testing portfolio the number one choice for operators worldwide.

> Our portfolio will meet your needs every step of the way .

TEST & MEASUREMENT
For troubleshooting and optimization

Offering a true subscriber perspective, Network Testing's Test & Measurement solutions enable operators to provide high-quality services faster and better than the competition.
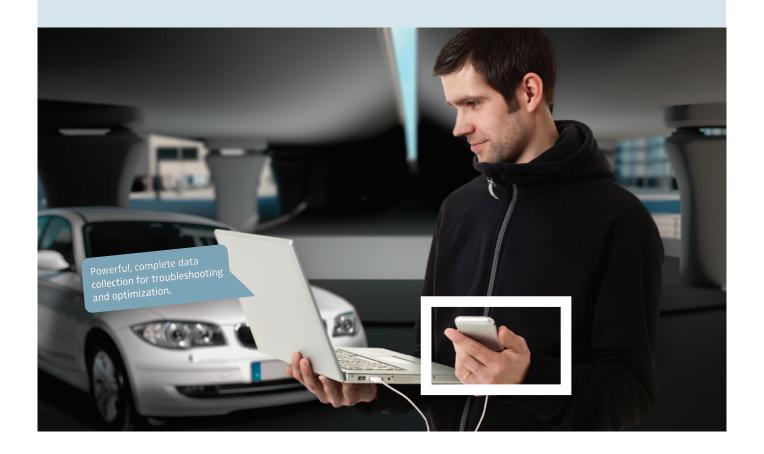
Our industry-leading products provide the best-known solutions in the world for troubleshooting, verifying, and optimizing new or existing networks. Our products also support seamless integration among the various types of networks during an upgrade or migration period.

Operators can rely on our experience and innovation in virtually every testing scenario as they strive to find and fix network problems before their customers become dissatisfied. We understand that quality is the key to any operator's success – it ensures customer satisfaction, boosts revenue, and provides an edge over the competition.

Network Testing's Test & Measurement solutions help operators efficiently provide the high-quality voice and data services their customers demand.

The entire Network Testing portfolio features multi-vendor, multi-technology capabilities. This is especially valuable in the Test & Measurement arena, because it allows operators to invest in tools that test all networks from a subscriber's point of view. The products are well-integrated and are designed for seamless post-processing with our Reporting & Analysis solutions.

Network Testing's Test & Measurement products allow operators to monitor, maintain, and troubleshoot a network efficiently, giving them the edge over their competition.

Powerful, complete data collection for troubleshooting and optimization.

PRODUCT OVERVIEW

Individual probes to test and evalutate the performance and quality
of wireless networks and services

TEMS™ INVESTIGATION

TEMS Investigation is the industry-leading tool for troubleshooting, verification, optimization, and maintenance of wireless networks. Offering data collection, real-time analysis, and post-processing all in one, TEMS Investigation is a complete solution for all of a network operator's daily network optimization tasks. Supporting all major technologies, including LTE and all the latest advances, this complete solution eliminates the need for multiple tools, reducing costs and saving time and effort for operations staff.

Offers comprehensive, industry-leading functionality

- Data collection as well as service testing
- Drive testing and indoor data collection
- Multiple means of presentation and total flexibility
- Single logfile replay as well as post-processing of multiple logfiles
- RAN tuning, KPI, and HTML-based reports
- Measurement access (export)

TEMS™ POCKET

TEMS Pocket is the most advanced and powerful hand-held tool on the market for verification, maintenance, and troubleshooting of mobile networks. Built directly into a variety of popular consumer phones, TEMS Pocket works as both a regular phone and as a powerful measurement solution that truly tests from the user's perspective.

Gives you the freedom to test anywhere

- Available in different packages for different users with different needs
- Data views for real-time monitoring
- Network event presentation
- Graph views (real-time)

Perform indoor, pedestrian,
and outdoor measurements.
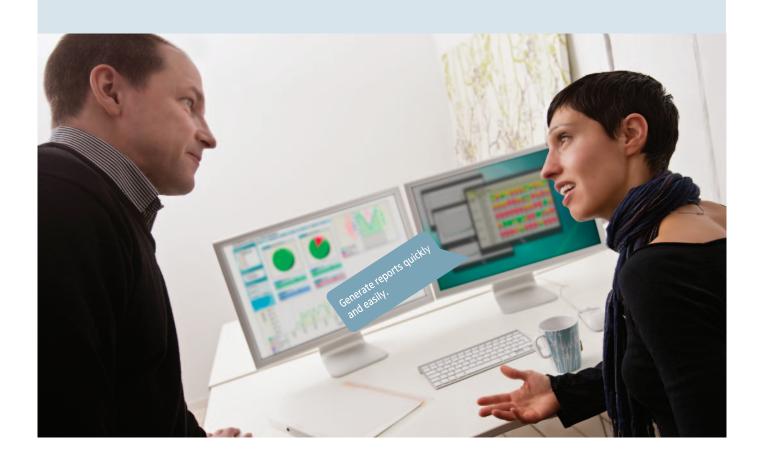
BENCHMARKING & MONITORING
For quality of service and experience

It is essential for operators to test the quality of service of their networks against their own standards as well as against the competition. Our Benchmarking products perform comprehensive data collection and analysis of service quality, while our Monitoring solutions focus on active testing and monitoring of mobile applications.

The key to our Benchmarking & Monitoring solutions is the focus on optimizing the user's experience. Our goal is making sure that mobile services and applications work the way they're supposed to, designing our software to provide solutions to specific challenges – and we always look at whole services from the only perspective that really matters: the user's. Doing that successfully means being able to coordinate a multitude of disciplines, ranging from content validation to network infrastructure and operations, handset design, and service deployment.

The comprehensive offerings in Network Testing's Benchmarking & Monitoring segment provide the types of network performance analysis required throughout the organization – from optimization engineers and the testing and benchmarking staff to the top managers.

These solutions help operators prioritize network enhancement and troubleshooting projects, which improves the efficiency of operations. Encompassing field measurements, analysis, final reports, and network improvement data, our offerings provide the accurate, comprehensive information operators require to make intelligent business decisions.

Generate reports quickly and easily.

PRODUCT OVERVIEW

Dedicated probe systems to benchmark and monitor the performance and quality
of wireless networks, services, and content

TEMS™ SYMPHONY SUITE

The TEMS Symphony Suite includes Network Testing's well-known benchmarking solutions. These rugged, advanced products support all major technologies.

SYMPHONY BENCHMARKERS

QVoice Symphony and Symphony Multi are our geographically targeted Quality of Service (QoS) wireless benchmarking solutions for cellular network operators. Providing voice, data, and video service testing, both products offer a wide range of supported phone and data cards and a modular configuration for easy installation and operation. The TEMS Symphony Suite is paired with Network Testing's QVoice Presentation software for optimal post-processing.

QVOICE COMPANION

Test engineers often need to conduct very specific measurements out in the field, requiring full processing power while remaining on the go. QVoice Companion fills exactly this niche, making the best capabilities of the QVoice Symphony benchmarking solution truly mobile. This cost-efficient, easy-to-handle product runs directly on a commercial laptop computer which controls testing and can also provide speech/video quality algorithms.

TEMS™ AUTOMATIC

TEMS Automatic is a truly autonomous system that delivers end-to-end Quality of Service information to all levels within the organization. It provides coverage analysis using various types of tests that place test calls throughout the network and transmit the data for processing and reporting. TEMS Automatic provides an overview of network quality as perceived by subscribers, while also providing details necessary for reporting, thorough troubleshooting, and analysis. In the competitive wireless environment, network quality is a key success factor. At the same time, efficient use of resources and personnel is crucial. TEMS Automatic lets operators boost quality efficiently.

TEMS™ MONITOR MASTER

TEMS Monitor Master is a software and hardware product for measuring the end-to-end quality and user experience of wireless and fixed line data and voice services. Designed to be highly flexible, TEMS Monitor Master is used by customers around the world for a variety of activities including large-scale revenue assurance testing, content testing, pre-launch multi-modal service testing, and roaming solutions. TEMS Monitor Master diagnoses and resolves faults quickly, and adapts easily to new and emergent technologies, so operators are always one step ahead.

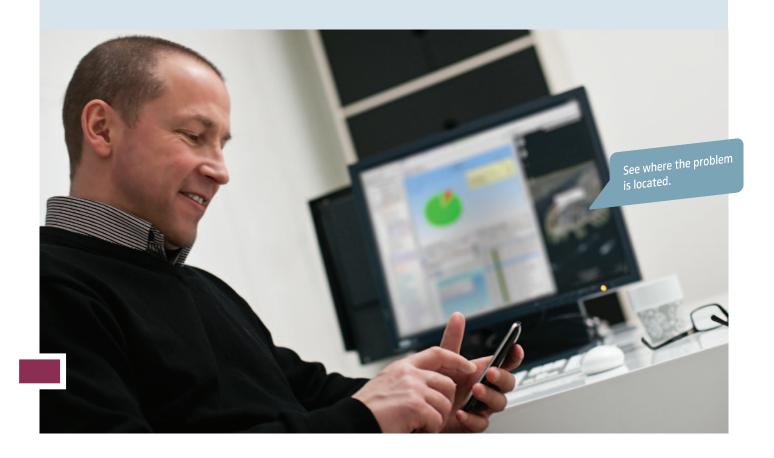Network quality as perceived
by your subscribers.

REPORTING & ANALYSIS
For post-processing and optimization

The benefits of Ascom's Network Testing portfolio extend beyond our world-class collection and benchmarking offerings. Our Reporting & Analysis solutions allow our customers to make the most of their network data, using it to identify, analyze, and accurately present network problems, foresee trends, and forecast network traffic.

The full range of our Reporting & Analysis offering corresponds to the breadth of the Network Testing portfolio. Our solutions are specifically designed and integrated with the other products in the portfolio to fulfill the operator's specific needs. This aids in making long- and short-term network decisions, improves internal efficiency, promotes network quality, supports customer satisfaction, and adds value to the investment in data collection solutions.

Reporting & Analysis allows network data to be transformed into actionable information, useful throughout the organization to improve quality and efficiency. Including proprietary algorithms, the most advanced functionality, and valuable, informative output, these products take Network Testing to the next level.

See where the problem is located.

PRODUCT OVERVIEW

Software to visualize, analyze, and report mobile network performance and quality

TEMS™ DISCOVERY

TEMS Discovery is a highly configurable and user-friendly post-processing solution for air interface measurement data. It allows engineers to easily assess wireless performance and quickly pinpoint network problems. With TEMS Discovery, the user has the flexibility to configure a wide range of items, from simple view layouts to sophisticated report templates and user-defined Key Performance Indicators (KPIs). TEMS Discovery is the preferred reporting solution for Network Testing's Test & Measurement products.

TEMS™ BOX OFFICE

TEMS Box Office is the preferred reporting platform for TEMS Monitor Master. It is a highly configurable and flexible business intelligence platform that empowers end users to create their own reports based on TEMS Monitor Master data. Reports are delivered via a Web browser; no special client is required.

TEMS™ VISUALIZATION

TEMS Visualization is revolutionizing the way network operators troubleshoot and optimize their networks, allowing them to find problems that were impossible to pinpoint before. TEMS Visualization analyzes the event-based data captured directly from the infrastructure, bridging the gap between traditional performance management solutions and drive-test tools.

Detailed analysis on large volumes of real user traffic.

LTE OFFERINGS

The Network Testing portfolio helps operators begin their LTE journey with commercially available products that support this exciting new technology. Jump ahead of the competition with the current releases of these products available with LTE support.

GO AHEAD

Ascom Network Testing demonstrates its technological leadership through the early and extensive development of its TEMS Long Term Evolution (LTE) solutions.
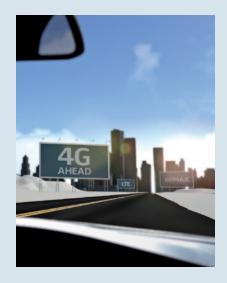
Worldwide deployment of LTE technology is being driven by explosive growth in demand for mobile network services, creating a need to increase bandwidth significantly – and cost-effectively.

From LTE's infancy, Ascom Network Testing has understood its potential contributions, and has been developing tools that support its capabilities. As a result, we can help mobile operators begin their LTE evolution today, with commercially available products that support this exciting new technology.

Although the rollout of LTE networks is just beginning in most regions, we have already built a rich array of LTE capabilities into our industry-leading tools. TEMS Investigation, TEMS Discovery, and TEMS Symphony are LTE-ready.

With nearly two decades of experience and a proven track record of technological innovation and quality-based offerings, Ascom Network Testing is the right partner for mobile operators to place their trust in when taking the next step toward LTE. We understand the challenges faced by operators today and the opportunities presented by LTE. The Network Testing portfolio will further evolve to include additional products with LTE support as this technology matures and more devices become available.

Network Testing helps guide your LTE evolution.

For many people around the world, mobile voice and data communication services have become a basic necessity in their everyday lives. To fulfill this ever-increasing need, telecommunications providers must deliver high-quality services efficiently. Ascom's Network Testing solutions are indispensable for operators if they want to maintain quality, retain subscribers, and streamline internal processes.

Along with high-quality voice services, Network Testing products support the explosive growth of mobile broadband and value-added data and content services. Our specialized expertise encompasses all major telecommunications technologies from any infrastructure vendor, with a special emphasis on the latest emerging technology standards.

Network operators, infrastructure vendors, service providers, and governmental regulatory bodies benefit from Network Testing offerings. We focus on multi-technology, multi-vendor solutions that test from the end-user's perspective, so that our customers can know exactly what consumers are experiencing. This subscriber perspective is incredibly valuable for troubleshooting, optimization, and benchmarking purposes.

Comprised of industry-leading products and complementary support and services, the Network Testing portfolio is the unrivaled industry leader in our market niche. Through internal development and strategic acquisitions, Ascom has assembled the strongest portfolio available for trouble-shooting, monitoring, and analysis.

The Network Testing portfolio includes offerings in the areas of Testing & Measurement, Benchmarking & Monitoring, and Reporting & Analysis.

Networks are constantly changing and growing. As you strive to grow your business and satisfy your customers, Ascom Network Testing will be right there with you.
Through 4G and beyond, we have the experience, the expertise, and the commitment to help you navigate through the ever-changing communications landscape.

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